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THE HORN SPEAKER

Happy Holidays

HOW I LEARNED TO HANDLE CODE

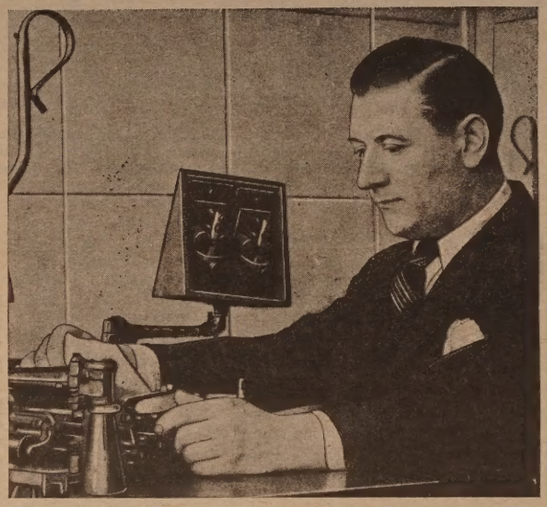
with Speed and Accuracy

vvv

By THEODORE R. McELROY

Official Champion Radio Operator of the World

The embryo "ham" operator is indeed fortunate in having the privilege of learning a few tips on how to learn the radio telegraph code, so as to transmit with speed and accuracy, from the world's official champion, Mr. McElroy. Some little-known facts about accurate code work are here given by Mr. McElroy.



Theodore R. McElroy, official champion radio operator of the world, who has copied code at the tremendous speed of 56½ words per minute.

● SINCE having won the wireless or radio code championship for three successive years, I have received many thousands of letters from radio operators and code students from every country in the world wanting to know my methods of training for the code tournaments. Now, for the first time, I am writing for publication, giving some of the facts pertaining to my career as a radio operator and my experiences as a champion.

In that my accomplishments have been so closely associated with the principles taught by Walter H. Candler, originator of the Candler System for code students and radio operators, I must necessarily give at least a brief explanation of this system.

The mind of a code student is comparable to a phonograph record, which reproduces exactly the material that has been recorded on it. Should there be an error in this material, the phonograph will reproduce the error as faithfully as it does the correct material, and so long as the record lasts that error will appear.

For some reason, initial mental impressions always are the strongest, the most enduring. Should the beginning code student receive, as all too frequently happens, the wrong impressions with relation to the dits and dahs comprising Continental Code, he will, like the phonograph, reproduce them just as faithfully as if they were correct. And, when these erroneous impressions are once received they are difficult indeed to eradicate; consequently, the student labors against a handicap which retards his progress. Personal contact with many aspiring code students during the past few years convinces me that a wrong beginning in this connection is the principal reason why the majority of code students find it very difficult to ever advance beyond the 8 to 10 words per minute class.

Fundamental Training Necessary

I can send and receive code as easily as I talk or listen to some one else talk, and while it is seemingly natural for me to do so, I recall the time when I did not know a dit from a dah. My ability to copy code at high rates of speed, several words behind the sender, is not natural. While I undoubtedly was born with the capacity, like every normal human, I had to acquire the ability by first learning the necessary fundamentals—by obtaining the right impressions, and by persistent practice under the experienced supervision and personal instructions of my teacher. And, in this respect, I want to tell you I was most fortunate, and I should feel that what I say here would be of little value to you should I fail to give you the facts as I know them from experience.

The all-important thing for the beginner is a thorough knowledge of the necessary fundamentals. The Candler System of training begins by defining these fundamentals upon which code accuracy and speed are based. The learning of code without this knowledge would be as difficult as trying to learn mathematics without a knowledge of the multiplication table. For example, Candler teaches the beginner that there is absolutely no space, that he can consciously allow, between parts of any code signal, with the exception of the period; that ditdah (. -) does not "stand for" A, but IS A. You must not translate. You must recognize the sounds, not as "standing for" certain letters, numerals or punctuations, but as BEING those signals. Now there is a reason for this which I shall amplify later.

Candler shows the student that if any perceptible space is allowed between parts of a signal, the signal will be something other than that for which it was meant; that is, A will be transmitted et; B, ts; C, nn; D, ti, and so on.

The philosophy of this method is appreciated when one listens in on any amateur band. Notwithstanding the fact that I hold the code receiving record, I find it very difficult to decipher the unevenly spaced transmission of the self-taught "ham." It is plain to him, no doubt, but to me his sending is comparable to a Chinese puzzle. I do not wish to deprecate all amateurs; some of them send beautiful code which it is a pleasure to copy. Some of our most efficient radio operators are amateurs.

Coordination

Until the student learns to coordinate he cannot hope to learn to send rapidly or accurately, no matter how much he indulges in *so-called* "practice," and it follows logically that his inability to transmit accurately retards his receiving progress. There can be no speed without coordination; trying to speed up without it is like a child trying to run, before having learned how to walk. Herein lies the big stumbling block of the self-taught student. When he goes on the air—and believe me, far too many are on the air—he sends like the following:

"6 - is - - - isa - - setmanle - - - - - tm - - it - - - hi - s - - - - s - ete - ti - ite - tm."

After the excitement subsides, the confused fellow who has been writing down this jumbled hodgepodge slowly and painfully decodes it thus:

"This is a sample of his sending."

If you believe I exaggerate, listen in on any of the amateur bands and judge for yourself.

The *Candler Code Guild*, an organization of Candler System graduates who broadcast regular practice programs, is accomplishing a great deal of good in this connection by sending out properly spaced practice material.

Before the student begins the study of code, Candler shows him how to study and practice. This mode of procedure is necessary, for study and practice without experienced guidance are but a waste of time and energy. He tells the student that a "dit" is made as rapidly as he can make it without cramping his arm, and that a "dah" is exactly three times longer, and must always be made the same way whether the student is transmitting at five or forty-five words per minute. There are no such things as short, medium and long "dahs" or slow, medium and fast "dits." Speed is determined by spacing between signals, between words and groups—never between parts of signals. Example:

(At 5 wpm) s--------e--------n--------d
(At 10 wpm) s------e------n------d
(At 15 wpm) s----e----n----d
(At 20 wpm) s--e--n--d

When a student has followed this system of spacing from 5 words per minute, step-by-step, until he can send 20 wpm. evenly and smoothly, he has developed his "timing sense" to such a degree that he automatically spaces all his signals uniformly at varying speeds. The self-taught fellow will send one word spaced at 20 wpm., another word spaced at 10 wpm., and another word spaced at 15 wpm., and so on, which works a hardship on the one who is trying to receive his transmission.

Spacing and every phase of code technique become semi-automatic with the

proper training and practice, and as the student's speed gradually increases he finds that within his limits he can read and send code without conscious effort, or as easily as he reads a book or listens to some one talk or writes, without thinking, consciously, of how words are spelled. This is the "secret," if I may so term it, of skill and speed.

"Sound Consciousness"

It is hard to determine the most important phase in learning code, but it is my belief that in fast, accurate reception, the element of "sound consciousness" plays a necessary part. To the untrained ear, *dits* and *dahs* sound alike, and always their similarity marks the "ceiling" or limit of a student's receiving ability; that is, if his receiving speed is 10 wpm., at 15 to 20 wpm., all dits and dahs sound alike to him. In this connection, I recall an amusing incident at the Chicago tournament where I received, at 56½ wpm., material from the Congressional Record, transmitted by a Wheatstone automatic. Charles O. Stimpson, now publisher of the *Radio Amateur Call Book*, was chief operator, and one of his duties was to listen in and keep check on the transmission.

Believe me, that was a rather tense five minutes for all of us. After the excitement was over and my copy was in the hands of the judges, Charlie emerged from his listening booth and approached me, a puzzled expression on his face.

"Listen, kid," he whispered in my ear, "did you get it?"

"Sure," I replied, surprised at his question. "Why do you ask?"

"Well, all I could hear," he explained, "was just one endless string of dits without even so much as a space anywhere."

Stimpson's receiving speed was around 40 wpm. Listening to transmission at 56½ wpm., faster than his limit, he had no "sound consciousness." All he heard was a string of dits. I give this incident to illustrate my meaning with reference to this phase.

Candler's original method of developing "sound consciousness," which treats specifically of the psychology of code reception, is, I am convinced, one of the principal reasons for the phenomenal success of his system of teaching code. Of course, I am well aware that every other phase of his method is an integral part of the system and contributes to the quick development of "sound consciousness" and aids the student in his progress, not only as a student, in overcoming the drudgery met with in learning code by ordinary methods, but as a radio operator doing fast, accurate work.

Conclusion

When I won the championship the first time, no one was more surprised than I. My nearest competitor was José Seron, a Chilean, who held the previous record of 49 wpm. I copied 51 wpm., for 5 minutes. The following year in the New York tournament, I copied 55 wpm., and the next year at Chicago I turned out 56½ wpm., and twenty minutes after this last performance, *I copied American Morse Code at 70 wpm., for 5 minutes!*

All this time I had been working as an American Morse operator for the Western Union in Boston, and I may add that one of my prize possessions is a letter of congratulation from Mr. Newcomb Carlton, President of the Western Union, who had never heard of me previous to my performance.

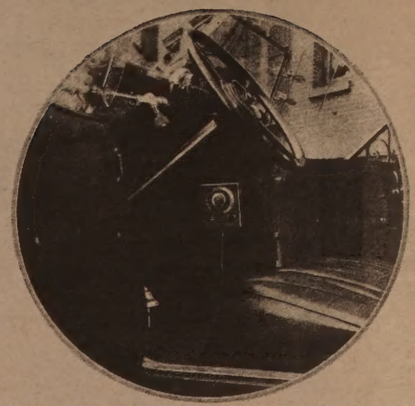
My success was due to the fact that I had been properly trained; I knew how to use my mind, how to concentrate, to coordinate my faculties, and my sound consciousness was developed to such a high degree that nothing escaped me. And now in concluding this brief account of my activities as a "ham," I want to state conscientiously that whatever success I may have achieved I owe to the thorough, scientific training of Walter Candler's methods. Under the same conditions, with the same training, any normal young man can accomplish what I did, perhaps more.

The above article appeared in Short Wave Craft for April 1933. On July 2, 1939 T. R. won a standing record of 75.2 words per minute.

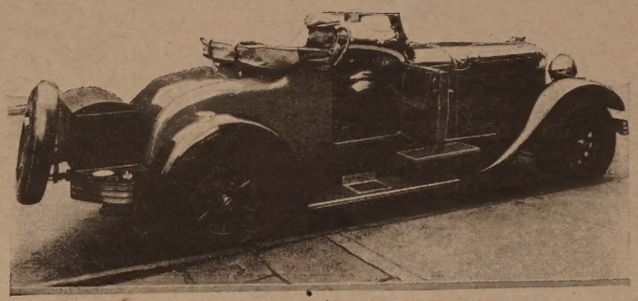
Radio News for October, 1930

Riding *the* Roads *with* Radio

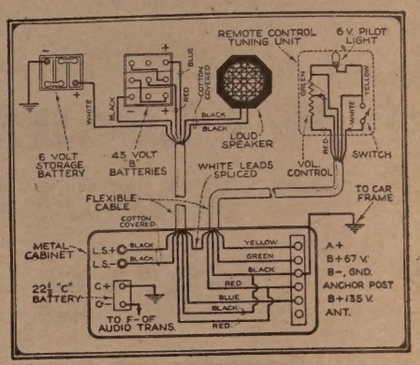
By Robert Hertzberg*



Shown above is the small remote-control unit for this auto installation



In the above picture, the receiver is mounted on the running board of the car and is enclosed in a metal housing. At the right is a diagram indicating the connections which must be made between the various units of the complete installation



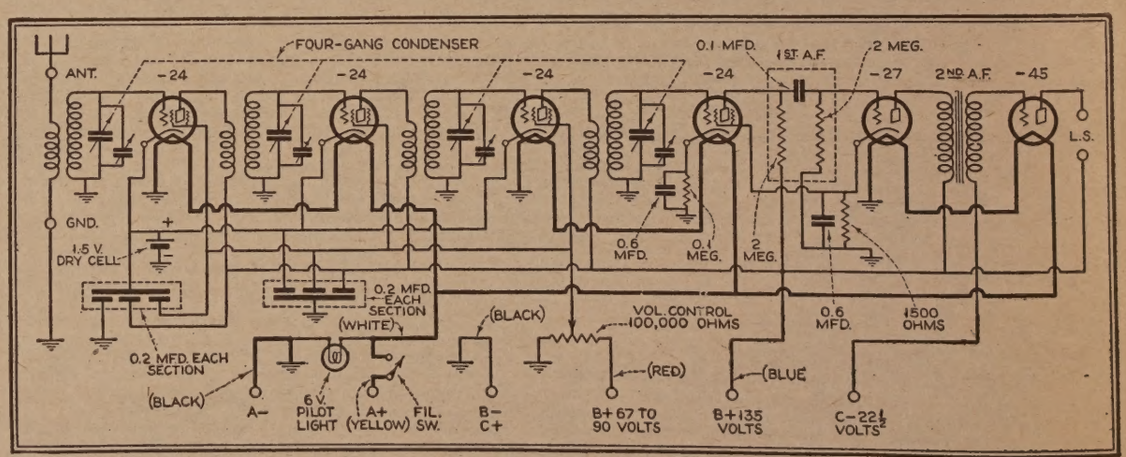
PRACTICALLY all of the automobile radio receivers that have appeared so far are intended for concealment behind the instrument board or under the engine covers.

A new set in kit form, recently placed on the market by the Pilot Radio & Tube Corporation, is rather unusual in that it is designed only for mounting on the running board, or possibly in the rumble seat of roadsters or coupés. The new outfit, bearing the name "Auto Pilot," must be assembled, wired and installed by the individual purchaser, who will find the work easy, interesting and enjoyable.

The receiving unit itself is contained in a black japanned steel case. This is 22 inches long, 8 inches wide and 6⅞ inches high, and is flat enough to let the floors of all makes of cars clear it by a comfortable margin. The set is controlled from the inside of the car by means of a flexible cable which terminates at a neat little control box 5½ inches square and 2 inches deep. The cable is six feet long and is enclosed in a protective sheath of waterproof fabric.

The movement of the dial on the control panel is transmitted to the shaft of the variable condenser by means of two brass chains fastened to pulleys at both ends. These chains slide in separate flexible tubes, and run quite smoothly in spite of their length. The other devices on the control panel are the usual pilot light, volume control and filament switch. The volume control is a potentiometer that regulates the voltages to screens of the r.f. tubes. (*Continued on page* 6)

*Pilot Radio & Tube Corp.



Above is the complete wiring diagram for the six-tube auto-radio receiver

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Double Conversion Double Talk

The single conversion superheterodyne is probably the most used piece of electronic equipment in the world today as the basis of almost every broadcast receiver. On the broadcast band, it does an excellent job of receiving where stations are separated by huge voids of empty spectrum (by amateur standards) so selectivity is not a serious problem. The frequency is low enough that low drift or good stability is not much of a requirement. This low frequency also allows adequate image and spurious rejection with very simple tuned circuits.

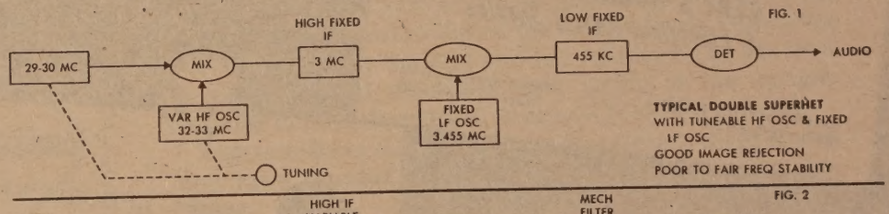
But try to use a single conversion receiver on the higher frequency ham bands and its deficiencies are greatly magnified. You first notice that you have your choice of two ten meter bands — one (the image) is a little weaker than the other, but still strong enough to create a problem when the band is crowded. You also notice that a slight jar of the table causes signals to disappear like magic. Warm-up drift becomes quite objectionable when the set is used on higher frequency bands, caused by the local oscillator which must operate near the high frequency signal in this type of circuit.

What can be done to cure these inherent faults of the single super? Assuming the same number of front end circuits, the only way to secure better image rejection is to use a higher IF frequency. But since a high IF frequency and good selectivity are not compatible, it is necessary to again convert this high IF to a lower frequency for selectivity purposes. This is double conversion. Frequently this 2nd conversion is done with a crystal oscillator, but the main source of drift, the tuneable oscillator, is still required to operate at a high frequency. (See Block Diagram #1.)

We have now cured *one* of the faults, poor image rejection. If carried no further — which often happens — the double conversion superheterodyne still drifts and its signals still warble.

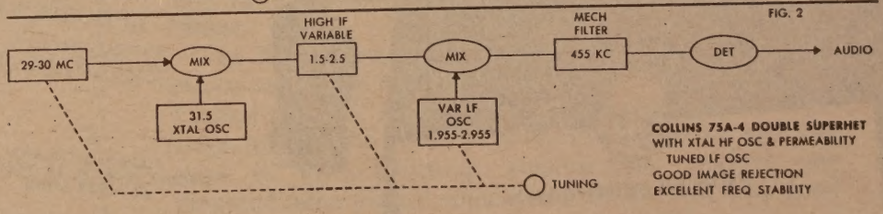
At Collins, we believe there is only one right way to build a double conversion super. That is to first convert the high frequency signal to a lower frequency signal by means of a stable crystal oscillator, providing good image rejection without introducing drift. We then tune this low frequency signal with a very stable linear oscillator, and since this oscillator is operating at a much lower frequency than the original signal, its drift and mechanical instability become almost negligible. A Mechanical Filter is then used for securing the best possible selectivity. This is not the easiest nor the least expensive way to build a receiver, but we have found it the only effective method of producing maximum performance. So look at the block diagram before you buy. Is it done the easy way or the right way?

FIG. 1



TYPICAL DOUBLE SUPERHET
WITH TUNEABLE HF OSC & FIXED LF OSC
GOOD IMAGE REJECTION
POOR TO FAIR FREQ STABILITY

FIG. 2



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EXCELLENT FREQ STABILITY

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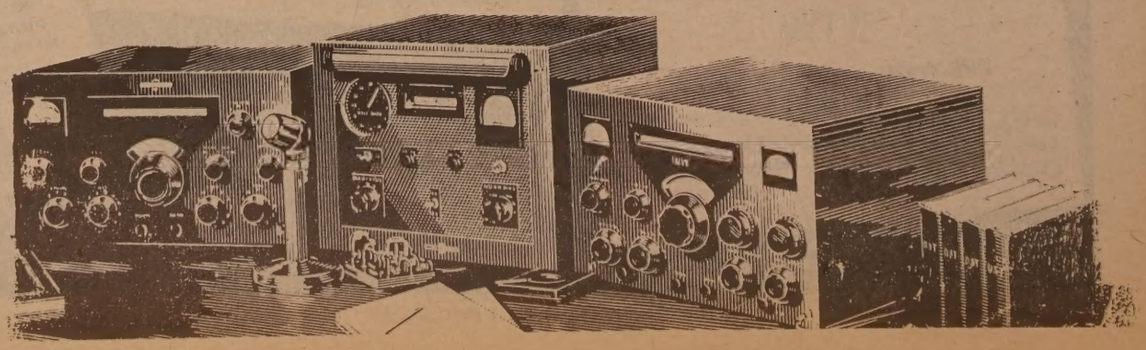

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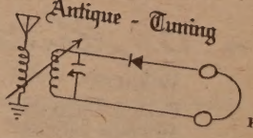

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The Grid

QUESTIONS AND ANSWERS

LOOPS

The writer would appreciate publication, in an early issue of RADIO BROADCAST, *of information concerning the construction of a loop antenna.*

H. H. S., Pittsburg, Pa.

IN WRITING to *The Grid* for constructional data, correspondents are requested to furnish the editor with all possible information concerning the use to which the apparatus is to be put. This should include, when pertinent, frequency (supply line), wavelength, voltage, current, sizes, the experience of the correspondent and a description of available material. This will greatly add to the facility with which our advice may be carried out, and to the general usefulness of this department.]

It is assumed that our inquirer desires to construct a loop for broadcast reception. The most desirable size for such a purpose is a compromise between the more efficient larger sizes and the convenience and mobility of a small frame—a square loop, three feet on a side, the various dimensions of which are indicated on the working drawing of Figure 1.

The loop is of the solenoid type, i. e., wound in "box" form rather than as a spiral. There are nine turns of wire, separated one-half inch, wound in grooves sawed in the end pieces. Any convenient wire may be used. Green double silk covered, number eighteen, is perhaps the most easily manipulated, and when wound on a stained frame, the finished loop presents a very creditable appearance.

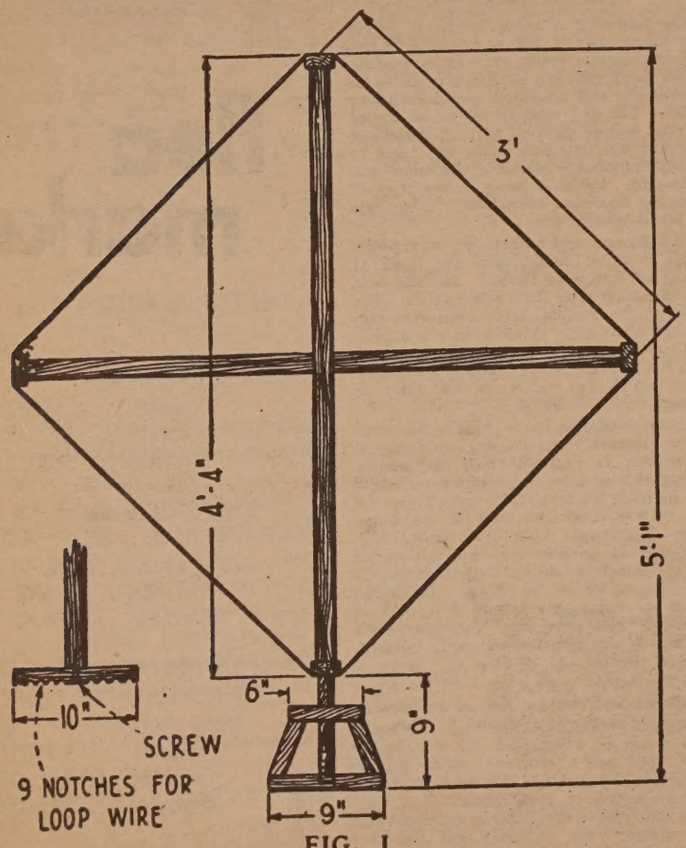

FIG. 1

Showing dimensions for a loop for broadcast reception

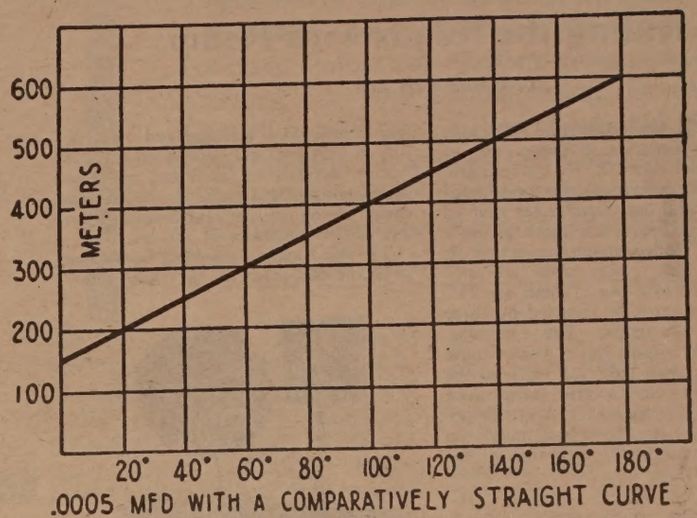

FIG. 2

The frame is constructed of one by one-and-a-half inch lumber. The upright may be drilled at the lower support on which the wires are strung to pass the middle wire. The other wires of course pass on either side of the upright. The construction of the base is clearly shown, the holes through the top and into the bottom being one inch in diameter, and the lower eight inches of the upright rounded to fit with sufficient looseness to permit turning.

Figure 2 shows the approximate wavelength range of this loop when shunted by the average .0005 mfd. plate condenser.

The indoor loop, as described, will give satisfactory results only when used with radio-frequency amplification. Employing two stages of transformer-coupled, or one stage tuned plate R. F. amplification, detector and two steps of audio-freqeuncy amplification, stations one thousand miles distant should be received with very good audibility.

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Have you ever discovered a fine old set in a place in which you thought that you would never find anything you wanted? If you have, please let us know, whether it be something rare or "garden variety." W'ed like to know about it.

I hope that all readers, interested in advertising in THE HORN SPEAKER, evaluate the rates as being reasonable enough to send T.H.S. plenty of ads.

Happy collecting, Jim

The Life and Work of Lee DeForest

(*Continued*)

LOVE ATTEMPTS TO ENTER

At four o'clock in the morning, with an air of the Gay Dog, Lee held his arm for his lady, hailed one of the cabs standing by, with a bit more of a flourish than was actually necessary to call the cabby's attention, helped Helen into the dark recesses of the musty-smelling vehicle, took his own seat and gave the man on the box the address. As the street lamps temporarily lighted up the interior of the cab, a young man might have been seen gazing with a discernible bit of worship in his face at the very tired and sleepy, though happy young girl beside him.

As with most such cases of young love there is an anticlimax, and it usually is surprisingly humorous and often pathetic, to the onlooker. At the house, the two revellers slipped into the parlor and doffed their wraps. Lee showed Helen to her room and on the stairs dared to mention his extreme happiness at having her as his guest to the greatest of Yale's annual functions.

Some of the busiest days of DeForest's life were spent in the laboratory shown in the above picture. It was here he made his first acquaintance with ether waves.

Now it has been mentioned that the young lady made her home in Boston and it is a generally known fact that Harvard is situated almost within a stone's throw of that town. And, one may conclude from the fact that the young lady was pretty, well bred and of good family, that she knew a much larger number of Harvard men than students from Yale. All these young men, in justice to their alma mater, had told her of the virtues of their own institution as opposed to the vices and shortcomings of their opponents, Yale. The volume of evidence decided the issue. At heart, Helen was loyal to Harvard. As the hour was very late and a drowsy hack ride had just been concluded, the young lady's reaction was more natural than studied. She repeated some chance remark that one of her Harvard friends had made. The result was instantaneous. Lee resented the fact that she should make so obvious her preference to a rival, nay a hated university, and said so.

Helen ended the incident with hauteur.

HELEN IS TAKEN ILL

The following morning found the young lady dangerously ill with appendicitis. After three days passed with a growing seriousness in her condition, her mother was called to the bed-side and a medical consultation was called. The girl was too ill to be moved and the doctors declared that an immediate operation was necessary. She was taken to a local hospital where the operation was performed. Lee paid her a visit every day while her condition was serious. Sometimes he would send flowers.

He had announced himself in several places in his diary as being "upon the verge of falling in love with Helen." He still held this idea even after the Prom episode. The visits to the hospital were sometimes tender and charming. After a long and perilous convalescence Helen was able to return with her mother to her home. "Poor little Prom girl," Lee wrote in his diary in closing this sad episode.

All the while, he was continuing his work in the laboratory and keeping constantly at his reading in electricity and mathematics. It was shortly after the beginning of 1897 that he made his first real acquaintance with the electric condenser, that is, he began some experiments with it. Immediately, thousands of possible uses for this device thrust themselves into his consciousness. Of them he wrote in his diary, "It flashed across me today—my special first field of electrical enterprise—the condenser—half brother to the transformer, more efficient, cheaper, lighter,—to develop it. Make it take the transformer's place both for phase alternation and also for step up and down—superseded everywhere—Millions! Then find how it can as well replace the storage battery, then store Heaven's fluid—and the world lies at my feet! My specialty then—the condenser—to lead instead of to lag! It is much more the stepping stone between the electrical art of today and the finer, more etherial, mysterious, 'wavey' form to which we must come. It is a ladder to the finer realms of God." Today the immense utility of the condenser, brought about chiefly by the development of the Radio Art which DeForest did so much to make possible, has strangely proven the foresight of this early prophecy.

This great vision of revising entirely the electrical field proved to be temporary, as his studies moved on and left the field of the condenser, passing to something else. Possibly it was because his next dozen lectures led him directly to the study of the self-same transformers which his new condensers were to supersede. One of his first laboratory assignments in connection with the study was the measurement of the self-inductance of the device with the aid of a Wheatstone Bridge and a telescope. He spent one whole Saturday at the task and at its conclusion asked God's deliverance from a repetition of it.

With these intensive measurements and calibrations in the laboratory he learned the application of his higher mathematics. And with the actual application of this entirely abstract subject he began to take an interest in it for its own sake. He joined the Math. Club and began attendance at its meetings regularly.

(*To be continued*)

Riding the Roads with Radio

(*Continued from page 2*)

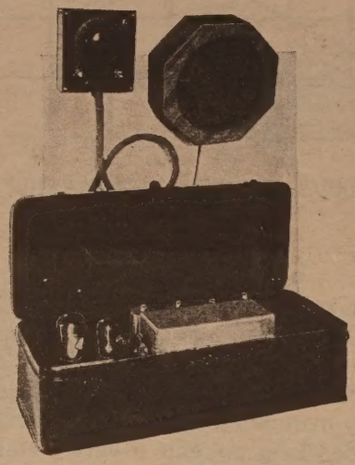
Electrically, the receiver is of simple but reliable design. It makes use of three stages of tuned R. F., a screen-grid detector, one resistance-capacity coupled audio stage and one transformer coupled stage. All the parts are mounted on a formed and drilled aluminum chassis or foundation unit. Six tubes are employed: four 224's, one 227 and one 245. Plate voltage must be supplied by three 45-volt "B" batteries. The 245 tube, used as the output valve, works quite satisfactorily with only 135 volts on the plate and 22½ on the grid, being much more convenient than a 171A in this position, because its 2½-volt filament can be ganged very nicely with that of the preceding 227.

R.F. Gain High

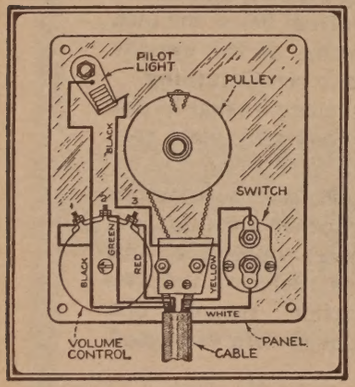
The radio-frequency gain in this receiver is pushed quite high and little attention is given to selectivity because this matter is taken care of automatically by the necessarily small antenna that is used. For an aerial, a pair of wires strung between the front and rear axles, under the car, has been found very effective. Where the shielding effect of the chassis is too great, a piece of copper screening may be tacked to the inside top of the car, or a wire run around the edges of the running boards.

The "Auto Pilot" kit does not include a loud speaker, a "B" battery container or spark-plug interference eliminators. However, a special flat speaker of the cone type is available as a separate accessory. The Pilot people feel that every car presents an individual problem as far as the placement of the "B" batteries is concerned, and leave its solution to the owner of the vehicle. The batteries may be placed under the rear seat, in the rumble seat of luggage carrier, or in a box suspended from the rear floorboard. The size and construction of this box will depend on the particular batteries on hand and the number of obstructions under the board. The choice of the ignition attachments is also left to the purchaser of the kit.

The left running board has been found to be the best place for the "Auto Pilot," as the left doors are used very much less frequently than the right ones. Holes are merely cut in the step-plate and the floorboard to pass the cable, and the case is bolted down. When the cover is closed the case looks like a perfectly innocent toolbox, and will not invite tampering by the inevitable small boys.



In this photograph are shown three of the four main elements of an auto-radio installation, the control mechanism, speaker and receiver. The fourth item is the battery container. Because of its all-steel construction, this receiver may quite readily be mounted on the running board of a car



Here are the layout and wiring details of the control board. A pulley and chain afford rotation of the tuning condenser shaft

The right runningboard may be used just as well as the left, as the accompanying illustrations show.

The control box may be placed in any convenient position, the instrument board being the preferred place. The box should be mounted as close as possible to either side of the car, to prevent the cable from interfering with the movement of the driver's or passenger's legs.

The "Auto Pilot" has been tested thoroughly and has proved to be sensitive, selective and sturdy. Sample sets have been driven thousands of miles in four representative cars: a Ford sedan, an Oakland coupé, a Hudson roadster, and a La Salle coach.

The price of the "Auto Pilot" kits is $47.50. This includes the case, the control panel, the cable and all the hardware and special parts, but no tubes, loud speakers, or batteries. Detailed instructions for assembly, installation and operation are furnished.

flea market

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FOR SALE — ELECTROLA

****

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FOR SALE BY D. H. MOORE: ELECTROLA (RCA) 64 CONSOLE, 6' High; Excellent Original Finish & Inlays; Original Buchram-Bound Record Albums Mint; Phonograph & Meter Intact; Cannot be shipped. Photographs Available. Price: $1,000. P. O. Box 521, Palo Alto, California - 94302.

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FOR SALE — FADA

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FADA NEUTRODYNE NO. 175A. ALL ORIGINAL. CABINET SOLID. NEEDS REFINISH WITH TUBES. NOT CHECKED AS FOUND. $85.00 PLUS SHIPPING. 50 LBS. RUSS OLMSTED, 608 W. THOMPSON LANE, MURFREESBORO, TN 37129.

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FOR SALE — GENERAL

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GOOD USED TUBES 75 cents each; Zenith K-725, Radiola 61-8; Transiton TP-4; GE-114; Motorola 55x11A; National 1945 multi-band Navy receiver - RAO-7; Conarscope model 250; Hewett Packard 400e AC voltmeter; Alfred square wave generator 850-1150 cps; B and K model 700 tube tester; Heathkit tube amp A-9B; old metal Connecticut telephone 5" X 5"; old plug-in crystals; 110vac power cords; speaker all sizes and shapes 25 cents each. Joseph Zambri, RD4, Box 216, Towanda, PA 18848 (717) 265-4825.

****

OLD RADIO CALLBOOK, COMPLETE RADIO AND CYCLOPEDIA, AK MODEL L SPEAKER, AK RADIO MODEL 30, SPLITDORF BATTERY RADIO, AK AC MODEL 40, STEWART WARNER BATTERY RADIO, (2) OLD B BATTERY ELIMINATORS, (1) OLD A BATTERY ELIMINATORS, 01A TUBES, QUACKERY - MACHINE (BOX MISSING), AMECO CODE PRACTICE OSCILLATOR AND MONITOR — RUSSELL SCHOEN, E7340 NIETZHE ROAD, CLINTONVILLE, WI 54929.

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BUY NOW, PRIVATE RADIO COLLECTION, lots of consoles, some small woods, some plastics, about 100 radios, price $10,000, call Ohio, (216) 497-0424.

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I HAVE A LIFETIME COLLECTION of electronic odds and ends including: radios from the 20's and 30's like three cathedrals, A.C. table top radios, early electric phonographs, barely used test equipment (tube type), Edison phonograph, antique typewriter, home made crystal set, oak wall telephone, home brew crystal set, early transistor radio (beauty) tubes from all times and places and small parts like chokes and transformers. I would like to sell the whole works for a reasonable price. All radios and equipment are in fine condition as for cabinets, etc. and all have been restored to working condition. Please call (904) 683-7202 or write Charles Kaelber, P. O. Box 3335, Spring Hill, FL 34606 for list of items.

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RAYTHEON BELMONT MODEL 30G1 COMPOSITE VIDEO GENERATOR WITH MANUAL - THE FIRST FLYING SPOT SCANNER GOOD CONDITION. MOTOROLA FREQUENCY MODULATION RECEIVER - MODEL F5R13B 14 TUBES, 2 FREQ. CONTROLS 7120 AND 4755. PLECTRON FM RADIO - MODEL CHEIF NO. 23 - RADIO FREQ. 33.80 TONE FREQ. 1750 -NOV. 14, 1960. CANK 23429 REMOTE CONTROL UNIT - 2 PHONE OUTLETS - 1 MIC. OUTLET RADIO, TRANSMITTER- RECEIVER WEATHER PROOF SWITCHES. MAKE OFFER ON ABOVE ITEMS, WILL CONSIDER RADIOS IN TRADE. — KENNETH MILLER, 10027 CALVIN STREET, PITTSBURGH, PA 15235. (412) 242-4701.

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RADIOLA III AND BALANCED AMP. COMBO $225 LESS TUBES; WESTINGHOUSE RS MODIFIED $100 LESS TUBES; RME69 WITH MATCHING SPEAKER $200; WANTED: TRANSMITTERS MADE BEFORE 1939 — PARKER, W1YG, 87 COVE ROAD, LYME, CT 06371.

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RADIOLA 60 wood cover $10; Radiola 60 foot $3; A.K. 37 power supply $5; A.K. 37 coils (3) $5; RCA 5T chassis $15; Zenith mod 5-R-312 wooden radio, no push button knobs, $15; Columbia Grafanola motor, turntable and crank $25; (5)nickel plated phonograph tone arms and tone arms supports $50; A.K. 42 chassis $15; Truetone model D2021 radio $25; W.E. 202 telephone (non-dial) all original $75; rca6BT chassis and speaker $15; Crosley model 506 wood radio (as-is) $20; Silvertone 6142 speaker (mint) $15; Crosley model 616 cabinet fair condition, $5; Stewart Warner 01-6D1 escutcheon and dial glass $5; UPS extra. — Jeff Gentry, 708 Locust Avenue, Charlottesville, VA 22901. (804) 295-1841.

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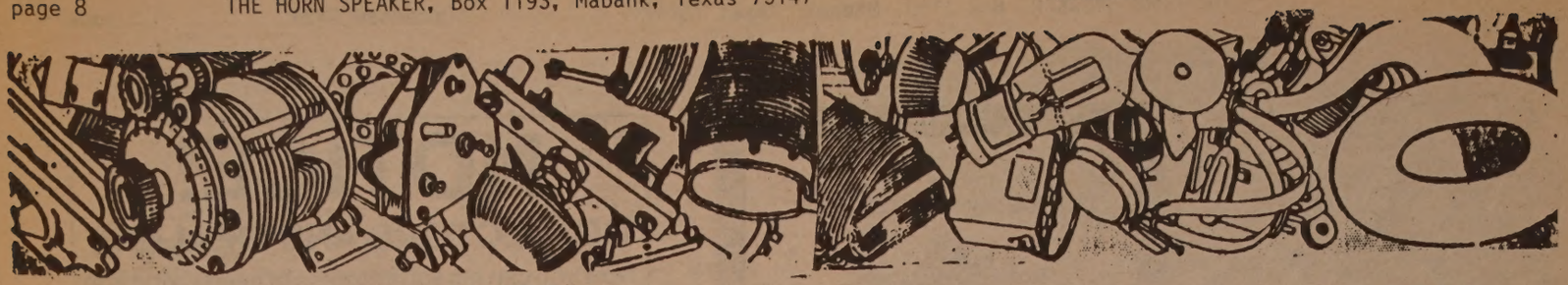

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AK MODEL R HORN BELL AND NECK ONLY; ORIGINAL OWNER'S MANUALS FOR RCA RADIOLAS VII, VIIB, AND IX; ACME DOUBLE CONE SPEAKER, GOOD COILS $35.00; RIDERS VOL. 1 THRU 14 $250.00; RCA RADIOLA GRAND PARTS SET $100.00; PHILCO GRANDFATHER'S CLOCK RADIO, RADIO WORKS, CLOCK AND FACE MISSING $195.00 (CAN'T SHIP); SHIPPING EXTRA. RAYMOND THOMPSON, 7422 CHERRY TREE DRIVE, FULTON, MD 20759.

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* N B C RADIO CHIMES complete with mallet. $375. firm. Please call (516) 742-0979 days.

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976 $75.00 — PHILCO 640 $85.00 — PHILCO 41-180 $100.00 — PHILCO 40-130 $75.00 — WESTINGHOUSE WR 30 FOS PG. 182 $110.00 — DOUBLE DOOR CONSOLES LOWBOY PHILCO 90 $125.00 — EDISON R7 REFINISHED $150.00 — SILVER MARSHALL MODEL J 10 TUBE $150.00 — APEX (US RADIO) C10 10 TUBE WITH TUNING METER $150.00 — ENGLISH PYE 5 BAND $45.00 — PYE 3 BAND $55.00 — SILVERTONE $60.00 —— DON REINSMA, 720 N 18TH AVENUE, PENSACOLA, FL 32501. PHONE (909) 433-2309.

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RCA TV Model 8PT7010 in red metal case in working condition. Included second set same model for parts. Make offer. John Schellkopf, 1344 Goucher Street, Pacific Palisades, CA 90272.

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FOR SALE — ZENITH

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ZENITH TABLE RADIO MODEL 6D2615 — WOOD CABINET — DOME TOP — 9" HIGH X 14 1/4" WIDE V.G. $75.00 —— Al Warren, Box 279 - Church Street, Waverly, PA 18471. (717) 587-2405. Shipping extra.

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I HAVE A CHASSIS for a Zenith 5301 console with 8 1/2" black dial, with tubes. $20.00 and UPS. H. F. Brammell, Box 319, Americus, KS 66835.

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THE CABINET IS IN MINT CONDITION and the radio plays. It is a Zenith 12 tube superhetrodyne with a tuning range 540-13400 kyc., chassis 1204-A. Marshall T. Bond, 8718 Linkfair lane, Houston, TX 77025. (713) 668-0029.

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FOR SALE: 1940'S VINTAGE ZENITH CONSOLE radio and phonograph. Cabinet is in excellent condition. $250.00 — Call (815) 838-5398. 5 p.m. to 10 p.m. c.s.t. Dick Stauss, Rt. 1 Box 399, Lockport, IL 60441.

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TRADE —— ATWATER KENT

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TRADE: I HAVE A NICE A-K 10 "breadboard" with M horn speaker for trade for a Collins bakelite panel amateur transmitter. Also need schematic for a Collins 32G transmitter. Parker, W1YG, 87 Cove Road, Lyme, CT 06371.

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WANTED —— ATWATER KENT

FOR MODEL 812 receiver, original factory service data, any other information, power transformer, Tune-A-Lite lamp. B. T. Wooters, W5KSO, 8303 E. Mansfield Avenue, Denver, CO 80237. (303) 770-5314.

WANTED —— EMERSON

CABINET FOR EMERSON RADIO MODEL #1002. FRANK TEDESCHI, 2402 BENSON AVENUE, BROOKLYN, NY 11214 (718) 373-1094.

WANTED —— GENERAL MOTORS

RADIO CHASSIS for a G. M. radio model 180 MA. Tubes and speaker not important, but helpful. George C. Arth, 2412 Washington Street, Lexington, MO 64067.

WANTED —— GENERAL RADIO

ALWAYS INTERESTED in older General Radio test equipment and components. Frederick G. Suffield, 817 West Fir, SEQUIM, WA 98382. (206) 683-6482.

WANTED —— GENERAL (mixed)

SCOTT SLR-F, RMCA AR-8506B OR HALLICRAFTERS S-22R MARINE RADIO RECEIVERS. OK IF NOT PLAYING BUT MECHANICALLY GOOD. JOE DEVONCHIK, WB4LUT, 5445 GROVE AVENUE, JACKSONVILLE, FL 32211. (904) 725-2331.

TOP LID AND LABEL FOR AIR-WAY TYPE "F". ALSO WANT CLEAN FEDERAL JR. CRYSTAL SET. WADE, 657 14TH AVENUE, PROSPECT PARK, PA 19026.

W.E. 14A AMPLIFIER. An "A" and "B" battery eliminator. Manufactured by Radio Research Company to replace battery tubes, such as 201A, etc. with 226 and 227 tubes. It had a 280 rectifier and a 210 amplifier. —— Tad Drogoski, 507 Coal Valley Road, Clairton, PA 15025.

(1) WWI EQUIPMENT (2) 01A tubes; Magnavox, yellow, blue and rainbow. (3) Fancy, unusual horn speakers. (4) Early galvanometers and medical instruments using them. (5) X-ray equipment and books, pre 1925. (6) Unusual portables. —— Have some items to trade or for sale. —— Mel Rosenthal, 5 The Strand, New Castle, DE 19720

RCA RADIOLAS VII AND VIIB. WILL PAY UP TO $1,000 FOR EACH IN GOOD CONDITION; RIDERS 1929 TROUBLESHOOTER'S MANUAL; PARTS FOR ZANEY GILL, SPARTON MODEL 15, ERLA MODEL S5, GREBE SYNCHROPHASE; POWER TRANSFORMER FOR ZENITH 8S463; AK MODEL 24 DELUXE; AK LITERATURE AND ADVERTIZING. RAYMOND THOMPSON, 7422 CHERRY TREE DRIVE, FULTON, MD 20759.

GERMAN AND JAPANESE, CIVILIAN AND MILITARY RADIOS WANTED. BILL MOORE, 1005 FIELDSTONE CT., HSV, AL 35803. (205) 880-1207.

ELECTRON TUBES - ALL KINDS - ALL QUANITIES - CONTACT: CHARLIE DRIPPS, 4331 MAXSON ROAD, EL MONTE, CA 91732. (818) 444-7079 FAX (818) 444-6863.

* INDEX FOR RIDERS AUTO RADIO VOL'S 1 AND 2. GERNSBACK OFFICIAL RADIO SERVICE MANUALS VOLUME 5, 6, INDEX. ANY PHILCO CATHEDRAL CABINETS OR UNRESTORED SETS. ANY JUKEBOX PARTS OR LITERATURE. INFORMATION ON AN ELECTRONICS MEASUREMENT CORP. MODEL 502 SIGNAL GENERATOR. BUICK TRANSISTOR RADIO. ANY TROY RADIO. CABINET FOR PILOT TV-37 TV SET. 3KP4 CRT. CAR RADIO SERVICE MANUALS AND PARTS BOOKS. NEW 600V CAPACITORS IN BULK LOTS. 50/30 MFD

– 150 V ELECTROLYTICS. REPLACEMENT OR FACTORY SNT., RF, IF COILS IN BOX LOTS. MEISNER COIL CATALOG GIVING INTERCHANGE FROM MFG. PART NUMBER TO MEISNER NUMBER. PHILCO 70 DIAL ESCUTCHEON (BEZEL) TUBE SHIELD. ALVIN HECKARD, RD 1, BOX 88, LEWISTOWN, PA 17044.

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* VICTOR THERAMIN., Complete if possible. Also power mains unit, as used in the 1926 Brunswick Panatrope/ with Radiola console PR148C or PR138. Herald horn for 1924. Amplion number AR-15t, Amplion number AR-45. George Anglin, 938 E. Prince Road, Tucson, AZ 85719. (602) 887-2899.

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* WANTED BY COLLECTOR/ RESTORER OLD AMATEUR TRANSMITTERS WITH BAKELITE PANELS AND SURFACE MOUNTED METERS; MILITARY TYPE TV-2 TUBE CHECKER. PARKER, W1YG, 87 COVE ROAD, LYME, CT 06371. (203) 434-7783.

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* SET OF KNOBS for Philco model 7T (page 124 F.O.S.) or Philco model 38-4. Conrad Spivey, 6226 S. Inwood, Shreveport, LA 71119. (318) 635-9056.

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* 1. BATTERY BOX FOR GREBE SYNCROPHASE MU1 — 2. BLUE NEUTROWOUND RADIO. FRED SCHULTZ, 1246 LINCOLNWAY S., LIGONIER, IN 46767. (219) 894-3092.

HOLTON ALTO Saxophone made in the 1920's. Must have at least a 5" diameter bell, gold or silver! Write to:: Saxophone, P. O. Box 773, Wausau, WI 54402.

FRONT DOOR of AK Kiel table. Also want 16mm sound print of 3 stooges, "A Plumbing We Will Go." Jim Baker, 704 Medway Road, Hagerstown, MD 21740-4130.

WANTED — GLOBE TROTTER

1946-1948 RCA "GLOBE-TROTTE2 AM portable radios. Must be in perfect working condition. Models 8BX6 and 66BX. Also original owner's manual for same. —— Mike Hanke, 1036 South 15th Avenue, Wausau, WI 54401.

WANTED — GLORITONE

CHASSIS for U. S. Gloritone cathedral radio, model 99A. Let me know what you have, price, etc. L. O. Evans, Sr., 202 Dianne Street, West Monroe, LA 71292.

WANTED — HALLICRAFTERS

HALLICRAFTERS SHORT model SX42. Call (312) 961-7737. Rich.

FOR SX-15 SKY CHALLENGER — original owner/ operator manual, any service information. B. T. Wooters, W5KSO, 8303 E. Mansfield Avenue, Denver, CO 80237. (303) 770-5314.

WANTED — LITERATURE

VOL. I NO. 3 MAY EVERDAY MECHANICS 1916 HOW TO BUILD A TRANS- ATLANTIC WIRELESS RECEIVING SET. PART I. K. L. LADD, 5240 44TH AVE S, MPLS., MN 55417. (612) 722-6786.

THOMAS E. CLARK's biography, CLARK WIRELESS and TECLA equipment, manuals, brochures, articles. PEERLESS WIRELESS of Detroit, any information? Photos, copies O.K. Send details and prices to Oran Sauder, Box 236-HS, South Lyon, MI 48178. (313) 437-4413.

QST-S FOR 1916 AND 1917 — R. ARROWSMITH, W4JNN, 3505 WOODBURN ROAD, ANNANDALE, VA 22003. (703) 560-7161.

RIDERS #1 TELEVISION SERVICE MANUAL AND RIDERS #2 RADIO SERVICE MANUAL. JIM CORIO, P.O. BOX 233, BLAWENBURG, NJ 08504.

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* OPERATING INSTRUCTIONS OR SCHEMATICS for the following. Electro Battery Eliminator, models F and P; Atwater Kent B power unit, model R; Instructograph code instructor; the Ferret test speaker model 721, manufactured by Coast Electronics; Sprague Tel-ohmike model TO-4 capacitor analyzer; Superior Genometer model TV-50 A; —— Tube Testers: pre c:sl development mdl III - Precision mdl. 10 - 12. Navsh:ps Tech. manual 93883 PLS. 6-24; Standardyne Radio, Standard Radio Corp.; RCA mdl. 64E3 superhet... FOR SALE: Riders volumes 6, 7, 8, 12. Walt White, 4203 Hookheath, El Paso, TX 79922. Tel: (915) 584-4744.

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* RADIO NEWS MAGAZINES: 1923; all except August and November, 1924; need March, April, May, June and September, 1925; need January, February, March, April and July 1926; all except January, February, April and October 1927; all except June, July, August, November and December 1928; need October, November and December 1929; all except March, June and September 1930; need December only. Have a few duplicates for trade. Send your lowest price and condition to —— Jim Fred, R 1, Box 41, Cutler, IN 46920.

WANTED —— NATIONAL

NATIONAL "VIDEO METER" wood or metal case - complete or not —— Fred Emerson, 627 Illinois Avenue, Elgin, IL 60120.

FOR NATIONAL HRO-50T receiver, original owner/ operator manual, CXO 100/1000 kc. xtal. calib., NBFM-50 adapter, SOJ-3 adapter, coil sets G, H, J, AB, AC. B. T. Wooters, W5KSO, 8303 E. Mansfield Avenue, Denver, CO 80237. (303) 770-5314.

WANTED DEAD OR ALIVE FOR RESTORATION OF NATIONAL HRO COMMUNICATIONS RADIO. OLDER MODEL PREFERRED USING EITHER 57/58 OR 6C6/6D6 TUBES. WILL PAY GOOD PRICE FOR COMPLETE UNITS WITH POWER SUPPLY AND COILS. DAVE MEDLEY, K1GQE, 1450 BAYVIEW HEIGHTS DRIVE, LOS OSOS, CA 93402.

WANTED —— PARTS, TUBES, ETC.

TRANSMITTING TUBE HF-150 — TCBA, RR6, BOX 181, GLENS FALLS, NY 12801

WANTED —— PHILCO

* PHILCO MODEL 90B. Cabinet must be in original condition; radio and speaker original; not working OK but prefer all in original condition. Norman Crane, P. O. Box 12564, Tucson, AZ 85732. Tel.: (602) 749-9140.

WANTED —— PLASTICS

CHASSIS, SPEAKER AND GLASS DIAL FOR AN ADDISON CATALIN MODEL ON CASE IS R5A3 or WILL TRADE CASE FOR SMALL ADDISON CATALIN. CASE IS IN GOOD SHAPE. COLOUR OF CASE MAROON WITH BUTTERSCOTCH. PLEASE WRITE TO: JOHN SMITH, 3824 DUTCH VILLAFE ROAD, APT. 52, HALIFAX, NOVA SCOTIA, CANADA. B3L 4G2 OR TELEPHONE (902) 445-2021 AFTER 6:00 P. M. WEEKDAYS.

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* LOOKING FOR catalin, mirror and novelty radios? "Sight Sound Style" 16 page quarterly features these collectable radios! Articles, photos, prices and classified ads. $14.00 yearly, first class— $4.00 single copy. —— SSS, Box 2224, So. Hack., NJ 07606.

WANTED —— RADIOLA

RADIOLA WANTED FOR 1923 PATENT BRUNSWICK MODEL BR100 RADIO-PHONOGRAPH UNIT. OPENING IN RADIO DECK IS 8 7/8" FRONT TO REAR, 16" SIDE TO SIDE AND DEPH CLEARANCE IS ABOUT 6" RADIOLA DROPS IN. PLEASE WRITE DICK ROZNOVSKY, P. O. BOX 480, RICHFIELD, OH 44286 OR CALL COLLECT (216) 659-6651.

WANTED —— SCOTT

WANTED: EH SCOTT, SCOTT transformer or World's Record radios, sometimes copper or chrome plated. Especially looking for Symphony, AC9, Shield Grid 10B, World's Record Super 9, Shield Grid 9B, AW13, AW19, AW27, pointer dial Philharmonic, any Scott in these cabinets: Secretaire, Napier, Warwick, Ravinia Grande, Laureate Grande. Also want original literature, especially issues of THE SCOTT NEWS. Contact me first if you have anything SCOTT to sell. Jim Clark, 1292 Starboard, Okemos, MI 48864. (517) 349-2249.

WANTED —— SONY

WANTED: OLD SONY radios. Jay Lewin, 400 east 54th Street, New York, NY 10022. (212) 935-5656.

WANTED —— TELEVISION

TV'S, TV'S, TV'S! "Sight Sound Style" is published quarterly, mailed first class, $14.00 yearly. Features vintage televisions; articles, photos, prices and advertisements! SSS, Box 2224, So. Hack., NJ 07606.

WANTED —— TEN TEC

WANTED: ANYTHING BY TEN TEC. Please state price and condition; condition unimportant: Herman F. Schnur, Rt. B Box 151, Greenville, NC 27858.

WANTED —— WESTERN ELECTRIC

* HORN FOR model no. 518W Western Electric. Also interested in tube and components for W. E. receivers and amplifiers. Ted Drogoski, 507 Coal Valley Road, Clairton, PA 15025.

WANTED —— ZENITH

* ZENITH - (any non working) 11 or 12 band "Oceanic" — And O-MANUALS or literature for any transistor types. Wade, 657 14 th Ave., Prospect Park, PA 19076.

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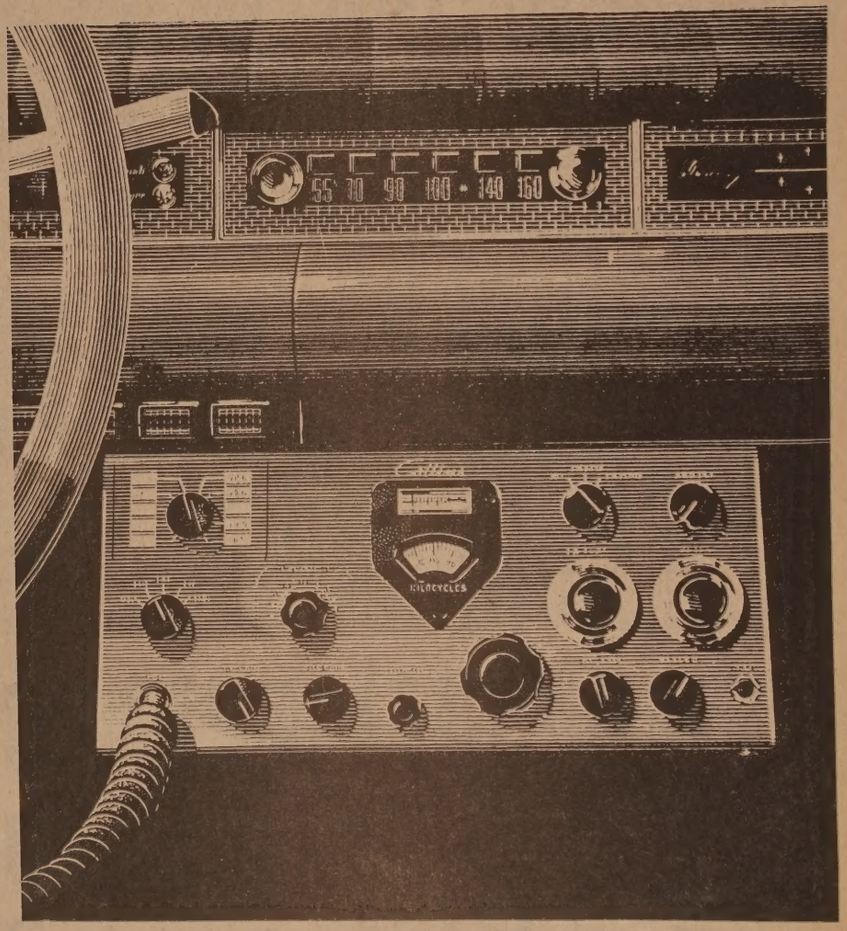

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